PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-074009
(43)Date of publication of application : 17.03.1998

(51)Int.CI. G03G 15/20
G03G 15/20

(21)Application number : 08-230999
(22)Date of filing : 30.08.1996

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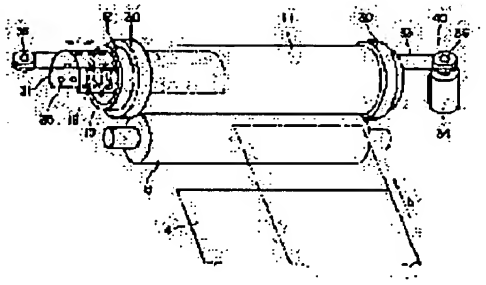
(54) FIXING DEVICE

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a fixing device capable of controlling efficiently the heat distribution of even a thin heating medium regardless of paper passing modes and suppressing the temp. rise in the non-paper passing regions of the heating medium.
SOLUTION: A magnetic flux shielding means 31 which shields a part of the magnetic fluxes reaching a metallic sleeve 11 from an induction coil 18 is arranged between the metallic sleeve 11 and the induction coil 18. The position of the magnetic flux shielding means 31 is changed by a displacing means 40 according to the paper-passing range of the metallic sleeve 11, by which the control of the heat distribution of the metallic sleeve 11 to be heated up is made possible regardless of the kinds of the sizes of the recording materials 14 to be passed.



LEGAL STATUS

[Date of request for examination]

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[Date of extinction of right]

(19)日本国特許庁（ＪＰ）　(12)公開特許公報（Ａ）　(11)特許出願公開番号

特開平10－74009

(43)公開日　平成10年(1998)３月17日

(51)Int.Cl.*	識別記号	庁内整理番号	ＦＩ		技術表示箇所
Ｇ０３Ｇ　15/20	１０１		Ｇ０３Ｇ　15/20	１０１	
	１０９			１０９	

審査請求　未請求　請求項の数10　ＯＬ　（全 10 頁）

(21)出願番号　特願平8－230999

(22)出願日　平成８年(1996)８月30日

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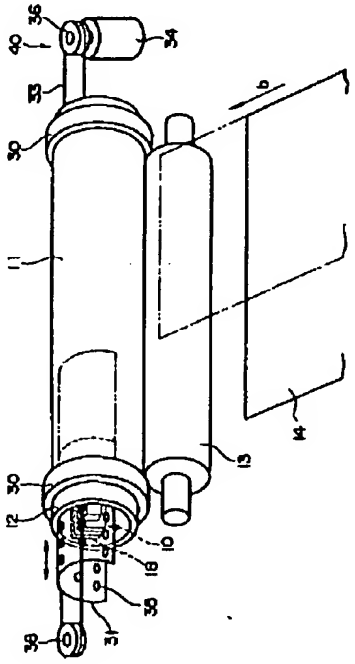
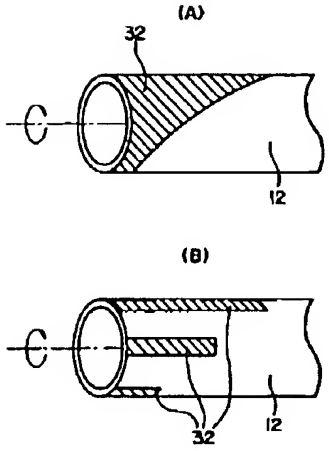
(54)【発明の名称】　定着装置

(57)【要約】
【課題】　薄肉の加熱媒体でも通紙モードに拘らず熱分布を効率良く制御でき、加熱媒体の非通紙領域における温度上昇を抑制し得る定着装置を提供する。
【解決手段】　金属スリーブ１１と誘導コイル１８との間に、誘導コイル１８から金属スリーブ１１へ届く磁束の一部を遮蔽する磁束遮蔽手段３１を配置し、該磁束遮蔽手段３１の位置を、金属スリーブ１１における通紙範囲に応じて、変位手段４０により変化させることにより、通紙する記録材１４のサイズの種類によらず昇温される金属スリーブ１１の熱分布をコントロール可能とした。



【図3】



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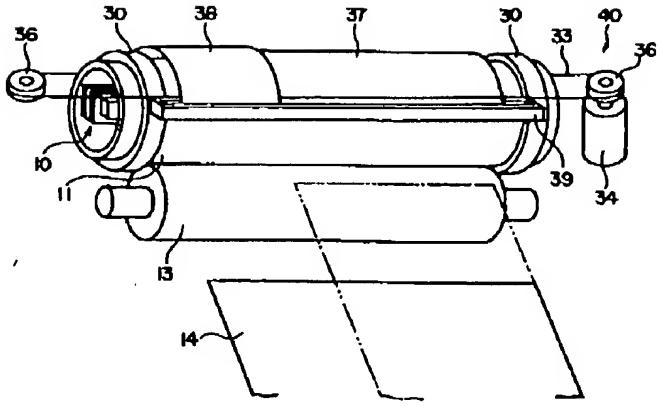

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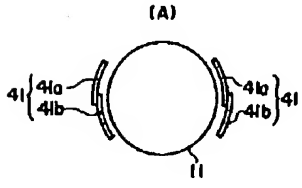

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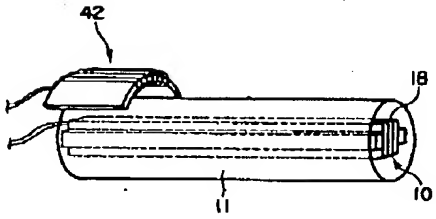

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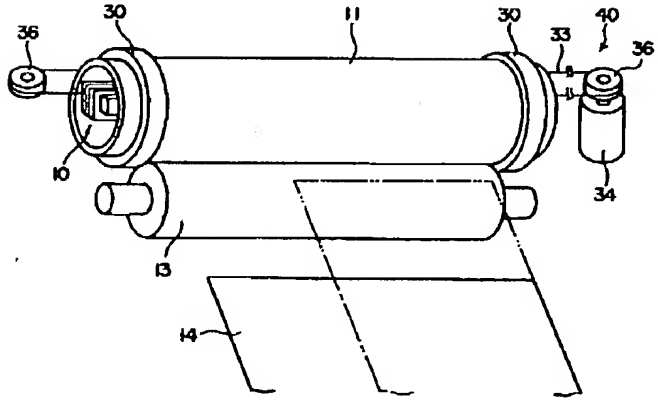

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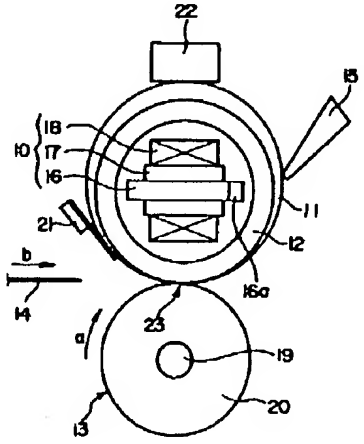


熱媒体がたとえ薄肉であっても、通紙する記録材のサイズの種類によらず昇温される加熱媒体の熱分布をコントロールすることが可能となり、また必要部分以外は発熱自体を抑えるようにしたので熱損失が小さく、省エネルギーともなる。

【0066】したがって、加熱媒体の非通紙領域における温度上昇を低減させることが可能となり、該加熱媒体の長手方向の温度ムラを抑制することができる。これにより、小形サイズ記録材の通紙直後の大形サイズ記録材の通紙時における定着性の部分的なムラによる高温オフセットの発生、同じく小形サイズ記録材の通紙直後の大形サイズ記録材の通紙時における温度ムラによる紙シワ、スキューあるいはジャムの発生、加熱媒体における温度分布差による内部熱応力の発生およびこれに伴う劣化、定着装置の構成部品の耐熱温度を越えることによる溶融、変形あるいは損傷などの加熱媒体の非通紙領域の温度上昇による不具合を、効率良く防止することができる。

【図面の簡単な説明】

【図1】　本発明の実施の形態1に係る誘導加熱方式の定着装置を概略で示す斜視図である。

【図2】　同定着装置の軸直角断面図である。

【図3】　（A）（B）は本発明の実施の形態2に係る誘導加熱方式の定着装置のホルダを概略で示す斜視図である。

【図4】　本発明の実施の形態3に係る誘導加熱方式の定着装置を概略で示す斜視図である。

【図5】　（A）（B）は本発明の実施の形態4に係る誘導加熱方式の定着装置の磁束吸収手段を金属スリーブと共に示す概略図である。

【図6】　本発明の実施の形態5に係る誘導加熱方式の定着装置の磁束発生手段を金属スリーブ及びコイル・アセンブリと共に概略で示す斜視図である。

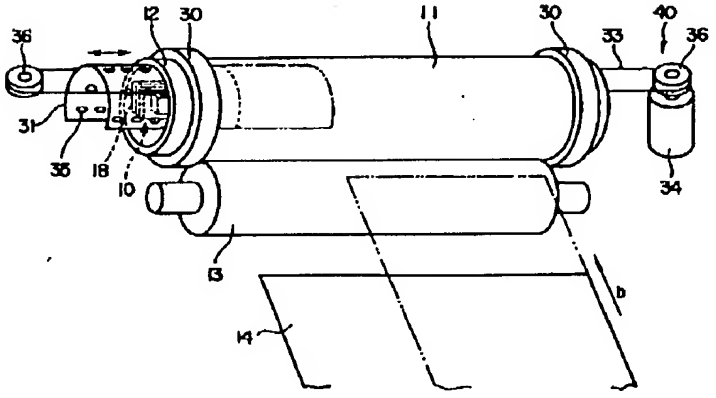
【図7】　本発明の実施の形態6に係る誘導加熱方式の定着装置を概略で示す斜視図である。

【図8】　本発明の実施の形態7に係る誘導加熱方式の定着装置の軸直角断面図である。

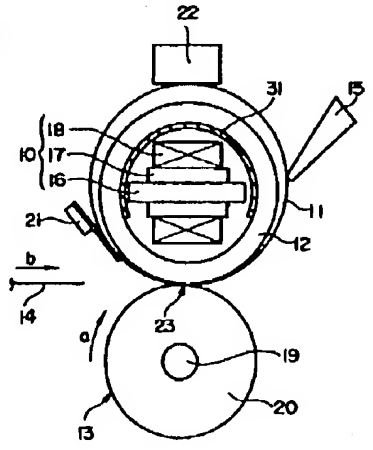
【符号の説明】

11…金属スリーブ（加熱媒体）、
12…ホルダ（絶縁部材）、
13…加圧ローラ、
14…記録材、
16…コア（芯材）、
18…誘導コイル（誘導加熱源）、
31，32…磁束遮蔽手段、
35…通孔、
37，38，41…磁束吸収部材、
40…変位手段、
42…磁束発生手段。

【図1】



【図2】



DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention relates to the fixing equipment of the copying machine of an electrophotography formula, a printer, facsimile, or those compound machines.
[0002]
[Description of the Prior Art] The fixing equipment which the toner (developer) of the toner image (non-established picture) imprinted on the record material which is the record medium conveyed is dissolved [equipment] with heat, and makes it weld on the record material concerned is formed in the copying machine of an electrophotography formula.
[0003] In this fixing equipment, although that which formed into the light-gage minor diameter the fixing roller which is a heating medium, the thing which carried out the pressure welding of the heating object to the body of revolution of a resin film from the inside of opposite Perilla frutescens (L.) Britton var. crispa (Thunb.) Decne., the thing which heats the body of revolution of a light-gage metal with IH are known in order to carry out a high-speed temperature up, all tend to make small the heat capacity of the body of revolution which is a heating medium, and it is going to heat them in a heat source with sufficient heating efficiency. Moreover, although there is also a thing using the non-contact source of heating, with image formation equipments, such as a copying machine, many fixing equipments of the type to which the body of revolution of thin meat is contacted to record material, and heating melting of the developer on record material is carried out are proposed from the point of cost or energy efficiency.
[0004]
[Problem(s) to be Solved by the Invention] However, since the cross section of a shaft right-angled cross section becomes very small when using the body of revolution of thin meat as a heating medium, in order to make heat capacity small, the rate of a heat transfer to shaft orientations is not good. this inclination -- thin -- it is so remarkable that it is ****, and becomes still lower with the quality of the material of the low resin of thermal conductivity etc.
[0005] When this sets [thermal conductivity] theta1-theta2 and length to L for the temperature gradient for lambda and two points, the heating value Q which gets across to unit time is clear also from the principle of the Fourier of being expressed with Q=lambda-f (theta1-theta2)/L.
[0006] Although this was satisfactory when ****(ing) a record lengthful of material of the longitudinal direction of body of revolution, i.e., the record material of the maximum main street paper width, and fixing it, when making the record material of small size with small width of face **** continuously, the temperature in the non-**** field of body of revolution rose rather than ** tone temperature, and there was a problem that the temperature gradient of the temperature in a **** field and the temperature in a non-**** field will become very large.
[0007] Therefore, when the record material of large-sized size is ****(ed) immediately after there being a possibility of the heat-resistant life of an edge strip which consists of resin material falling, or covering a thermal injury, and making the record material of small size **** continuously further for the temperature nonuniformity of the longitudinal direction of such a heating medium, there is also a problem that there are paper Siwa by partial temperature nonuniformity, a skew, etc. and a possibility that fixing nonuniformity may arise.
[0008] It will spread, so that the temperature gradient of such a **** field and a non-**** field has the large heat capacity of the record material conveyed and a throughput (print number of sheets around unit time) is made high. For this reason, when the body of revolution of low-fever capacity constituted fixing equipment from thin meat, application to the high copying machine of a throughput etc. was made difficult.
[0009] On the other hand, the source of heating is divided and what is alternatively energized so that the field according to ****** may be heated is known for the fixing equipment which used the halogen lamp and the exoergic resistor as a source of heating. Morcover, there are some which divide the source of heating similarly in the fixing equipment which made the induction coil the source of heating, and are energized alternatively.
[0010] However, if two or more sources of heating are prepared or it divides, the control circuit of the part is also complicated, if cost also tends to become high and it is going to make it correspond to the record material of further various width of face, its number of partitions will also increase further and it will become what also has still higher cost. And when body of revolution of thin meat is made into a heating medium, the temperature distribution near the boundary line at the time of dividing are discontinuous and uneven, and there is a possibility of affecting a fixing performance.
[0011] Made in order that this invention may solve the technical problem accompanying the above-mentioned conventional

technology, the purpose of this invention can control heat distribution also by the heating medium of thin meat efficiently irrespective of **** mode, and is to offer the fixing equipment which can suppress the temperature rise in the non-**** field of a heating medium.

[0012]

[Means for Solving the Problem] Invention according to claim 1 which attains the above-mentioned purpose in the fixing equipment to which the developer of the non-established picture which has the heating medium which has a conductive layer, and the source of IH which heats this heating medium with IH, and was formed on the record material conveyed is dissolved, and is fixed with the heat of the aforementioned heating medium It is arranged between the aforementioned heating medium and the aforementioned source of IH, and is characterized by having a magnetic-flux cover means to cover a part of magnetic flux which reaches the aforementioned heating medium from the aforementioned source of IH, and a displacement means to change the position of this magnetic-flux cover means. It is establishing a magnetic-flux cover means and making it move, if it is in this invention, and it becomes possible by covering the magnetic flux which arrives from the source of IH except a required portion, and suppressing the generation of heat itself to control the heat distribution of the heating medium by which control of the exoergic range is performed and a temperature up is carried out.

[0013] the **** range [in / the aforementioned heating medium / on the fixing equipment of the claim 1 above-mentioned publication, and / invention / according to claim 2 / in the aforementioned magnetic-flux cover means] -- responding -- the above -- a variation rate -- it is characterized by the position changing with meanses If it is in this invention, when ****(ing) the record material of small size, the variation rate of the position of a magnetic-flux cover means is carried out by the displacement means to a wrap position in the source of IH of the range equivalent to the non-**** field of a heating medium. The magnetic flux which reaches the non-**** field of a heating medium from the source of IH is covered by this, and the situation where the temperature of the heating medium in a non-**** field rises rather than the ** tone temperature of the heating medium in a **** field is prevented. On the other hand, when ****(ing) the record material of large-sized size, by the displacement means, a magnetic-flux cover means is evacuated to the outside of ****** of the record material of large-sized size, and a heating medium is uniformly heated in response to the magnetic flux from the source of IH. Thus, since the position of a magnetic-flux cover means is changed according to the **** range, correspondence in the record material of various width of face is attained.

[0014] Invention according to claim 3 is characterized by preparing the aforementioned magnetic-flux cover means in the front face of the insulating member arranged between the aforementioned heating medium and the aforementioned source of IH in the fixing equipment of the claim 1 above-mentioned publication. If it is in this invention, a magnetic-flux cover means is arranged certainly and compactly, and the variation rate of the position of a magnetic-flux cover means is carried out with the aforementioned insulating member. Moreover, if constituted especially possible [rotation of the aforementioned insulating member], it will become controllable [the heat distribution of a heating medium] by rotating the insulating member concerned in the space which the range of a covered portion could be changed, therefore was restricted extremely.

[0015] Invention according to claim 4 is characterized by forming a through-hole in the aforementioned magnetic-flux cover means in the fixing equipment of the claim 1 above-mentioned publication. If it is in this invention, since the amount of magnetic flux which penetrates a magnetic-flux cover means and arrives towards a heating medium is controllable, it is prevented that the temperature of the non-**** field of a heating medium falls more than required.

[0016] Invention according to claim 5 has the heating medium which has a conductive layer, and the source of IH which heats this heating medium with IH. In the fixing equipment to which the developer of the non-established picture formed on the record material conveyed is dissolved, and is fixed with the heat of the aforementioned heating medium the magnetic-flux absorption member which absorbs magnetic flux to the aforementioned source of IH, and an opposite side to the aforementioned heating medium -- arranging -- this magnetic-flux absorption -- it is characterized by making it change the position of a member according to the **** range in the aforementioned heating medium If it is in this invention, by establishing a magnetic-flux absorption means and making it move, the flux density to a heating medium is changed partially, and it becomes possible to control energy-absorption efficiency according to ******.

[0017] Invention according to claim 6 is characterized by for the aforementioned magnetic-flux absorption member deforming with temperature, and the position changing in the fixing equipment of the claim 5 above-mentioned publication. If it is in this invention, since a magnetic-flux absorption means has such a magnetic good combination that it is close to a heating medium, calorific value is partially changed by the aforementioned deformation by changing the distance from the heating medium of a magnetic-flux absorption means.

[0018] Invention according to claim 7 has the heating medium which has a conductive layer, and the source of IH which heats this heating medium with IH. In the fixing equipment to which the developer of the non-established picture formed on the record material conveyed is dissolved, and is fixed with the heat of the aforementioned heating medium It has a magnetic-flux generating means to generate the magnetic flux which the aforementioned source of IH generates, and the magnetic flux from which a phase differs, and is characterized by changing the generating range of the magnetic flux from which the aforementioned phase differs according to the **** range in the aforementioned heating medium. If it is in this invention, by changing the amount of current passed to a magnetic-flux generating means, or moving a magnetic-flux generating means, the generating range of the magnetic flux from which the aforementioned phase differs according to the **** range is changed, and the exoergic range of a heating medium is controlled.

[0019] Invention according to claim 8 is characterized by to change the position of the aforementioned source of IH according to the **** range in the aforementioned heating medium in the fixing equipment to which the developer of the non-established

picture which has the heating medium which has a conductive layer, and the source of IH which heats this heating medium with IH, and was formed on the record material conveyed is dissolved, and is fixed with the heat of the aforementioned heating medium. If it is in this invention, when the edge of the source of IH keeps away from the edge of a heating medium to the method of outside, at the edge of the heating medium of the opposite side, magnetic combination becomes weak and calorific value is changed partially.

[0020] In the fixing equipment to which the developer of the non-established picture which invention according to claim 9 has the heating medium which has a conductive layer, and the source of IH which heats this heating medium with IH, and was formed on the record material conveyed dissolves, and fixes with the heat of the aforementioned heating medium, it is characterized by for the aforementioned source of IH to have a core material, and to change some positions of the aforementioned core material according to the **** range in the aforementioned heating medium. If it is in this invention, magnetic combination can be partially changed by moving a part of core material for strengthening the magnetic combination with a heating medium, and, thereby, it becomes possible to change the exoergic range or calorific value.

[0021] Invention according to claim 10 is characterized by the aforementioned heating medium being the body of revolution of the thin meat which has flexibility in fixing equipment given in any 1 term of the above-mentioned claims 1-9. Control of the exoergic range is effectively performed, so that a heat transfer is difficult a heating medium for a longitudinal direction with thin meat, if it is in this invention.

[0022]

[Embodiments of the Invention] Hereafter, the gestalt of operation of this invention is explained based on a drawing. The perspective diagram and drawing 2 which roughly show the fixing equipment of the IH method which drawing 1 requires for the gestalt 1 of operation of this invention are the shaft right-angled cross section of identification arrival equipment.

[0023] The IH fixing equipment shown in drawing 1 and drawing 2 the developer of the non-established picture formed on the record material 14 which is the record medium conveyed The coil assembly 10 which dissolves with heat, is made to weld on the record material 14 bodies concerned, and produces a RF magnetic field, The metal sleeve 11 (it is equivalent to a heating medium) which was heated by the coil assembly 10 and prepared free [movement] along the conveyance direction of the record material 14, It has the fixed electrode holder 12 (it is equivalent to insulating member) in which the metal sleeve 11 carries out sliding contact, and the pressurization roller 13 which counters a electrode holder 12 and the metal sleeve 11 through the conveyance way of the record material 14, and carries out a pressure welding to these. The pressurization roller 13 is formed in the direction of drawing 2 Nakaya mark a possible [rotation], and the metal sleeve 11 is pinched between the pressurization roller 13 and a electrode holder 12, and it carries out follower rotation with rotation of the pressurization roller 13. In addition, the sign in drawing 1 "30" shows a member stop coming together for preventing the approach to the side of the metal sleeve 11.

[0024] The record material 14 by which the non-established toner image is imprinted is conveyed from the direction shown by the arrow b in drawing, and is sent in towards the nip section 23 which pinches the record material 14. The record material 14 has the nip section 23 conveyed, while the heat of the heated metal sleeve 11 and the pressure which acts from the pressurization roller 13 are applied. Thereby, it is fixed to a non-established toner and a fixing toner image is formed on the record material 14. It is separated from the metal sleeve 11 by the separation presser foot stitch tongue 15 with which a point contacts the front face of the metal sleeve 11, and the record material 14 which passed the nip section 23 is conveyed in the direction of drawing 2 Nakamigi. This record material 14 is conveyed with the delivery roller which is not illustrated, and is discharged on a delivery tray.

[0025] The aforementioned metal sleeve 11 is a hollow metallic conductor of thin meat which has flexibility, for example, has the conductive layer formed from conductive magnetism material, such as nickel, iron, and SUS430. And the periphery front face of the metal sleeve 11 is coated with a fluororesin, and the heat-resistant mold release layer is formed in it. The metal layer thickness of the metal sleeve 11 is 20 micrometers - 60 micrometers.

[0026] In order to make the interior of the metal sleeve 11 carry out induction of the induced current (eddy current) to the metal sleeve 11 concerned and to make it carry out joule generation of heat, the coil assembly 10 which produces a RF magnetic field is arranged in it. This coil assembly 10 is held inside the electrode holder 12. It is fixed to the fixing unit frame which is not illustrated, and the electrode holder 12 serves as nonrotation.

[0027] The coil assembly 10 has the core 16 (it is equivalent to a core material) which consists of magnetic material, the bobbin 17 with which the through-hole for inserting a core 16 was formed, and the induction coil 18 (it is equivalent to the source of IH) which winds copper wire around the circumference of this bobbin 17, is formed in it, is made to carry out induction of the induced current to the metal sleeve 11, and is heated. As a core 16, a small material of self-loss with large permeability is good, for example, the ferrite, the permalloy, the Sendust, etc. are suitable. The bobbin 17 is functioning as the insulating section which insulates a core 16 and an induction coil 18. And in the bobbin 17, the coil assembly 10 is contained so that it may not expose outside in the aforementioned electrode holder 12 formed in another object.

[0028] The electrode holder 12, the bobbin 17, and the separation presser foot stitch tongue 15 are formed from the heatproof and the electric insulation engineering plastic.

[0029] The pressurization roller 13 consists of an axis 19 and a silicone rubber layer 20 which is a surface mold-release characteristic heatproof rubber layer formed in the circumference of the axis 19 concerned.

[0030] The temperature sensor 21 which detects the temperature of the metal sleeve 11 concerned is formed above the metal sleeve 11. The pressure welding of this temperature sensor 21 is carried out to the front face of the metal sleeve 11 so that the metal sleeve 11 may be separated and an induction coil 18 may be faced. A temperature sensor 21 consisting of thermistors and this thermistor detecting the temperature of the metal sleeve 11, the energization to an induction coil 18 is controlled so that the

temperature of the metal sleeve 11 turns into optimum temperature.
[0031] The thermostat 22 is further formed above the metal sleeve 11 as a safe mechanism at the time of temperature unusual elevation. This thermostat 22 touches the front face of the metal sleeve 11, if it becomes the temperature set up beforehand, the contact would be opened wide, the energization to an induction coil 18 would be disconnected, and the metal sleeve 11 will have prevented the elevated temperature more than predetermined temperature, and the bird clapper.
[0032] Especially with the gestalt 1 of operation, between the metal sleeve 11 and the induction coil 18, as the inside of a electrode holder 12 is met, the magnetic-flux shield 31 (it is equivalent to a magnetic-flux cover means) which covers a part of magnetic flux which reaches the metal sleeve 11 from an induction coil 18 is formed possible [movement], and it has composition which can control the exoergic range by the induced current by changing the position of the magnetic-flux shield 31 to shaft orientations by the displacement means 40. Moreover, control of this exoergic range becomes what has so effective [a heat transfer] for it with thin meat that it is difficult for a longitudinal direction a heating medium like the metal sleeve 11.
[0033] The displacement means 40 has the wire 33 connected with the magnetic-flux shield 31, the pulley 36 with which a wire 33 is constructed across and which can be rotated, and the motor 34 which carries out the rotation drive of the pulley 36, and can make the forward/backward moving of the magnetic-flux shield 31 carry out in the direction of the arrow in drawing by the drive of a motor 34. A step motor etc. is used for a motor 34. In addition, it is also possible to consider as the composition which the displacement means 40 is not limited to such composition, and uses a belt instead of a wire 33, or carries out forward/backward moving with a screw screw thread.
[0034] The ferrite with the large specific resistance which shuts up the copper which is the conductor which passes the induced current as a magnetic-flux shield 31, and is a non-magnetic material with small specific resistance, aluminum, silver, its alloy, or magnetic flux etc. is suitable. In addition, since it generates heat itself simultaneously, when using these, it is necessary to form through-holes, such as a circular hole and a slit, and to suppress generation of heat by the eddy current, although a magnetic material like iron or nickel also covers magnetic flux.
[0035] the induction coil 18 of the shaft-orientations range with which the magnetic-flux shield 31 is equivalent to the non-**** field of the metal sleeve 11 like illustration when [of an induction coil 18] the wrap radii curved surface is presented and the record material (a two-dot chain line shows in drawing 1) of small size is ****(ed) mainly in an upper half -- up to a wrap position (a two-dot chain line shows in drawing 1) -- a variation rate -- it is moved by the means 40 On the other hand, when the record material of large-sized size is ****(ed), the magnetic-flux shield 31 is evacuated to the outside of ****** of the record material of large-sized size. Thus, since the position is changed to the magnetic-flux shield 31 by the displacement means 40 according to the **** range in the metal sleeve 11, the correspondence of it in the record material of various width of face is attained. Although this **** range is considered as the composition which acquires information by the size detection means of the feed section of record material, it is good also as composition detected by establishing two or more meanses to detect the temperature of the metal sleeve 11 or pressurization roller 13 grade, in accordance with shaft orientations (neither is illustrated). In addition, it is also possible for the magnetic-flux shield 31 not to be restricted to the thing of a radii curved surface, but to consider as the shape of a cylindrical shape.
[0036] Moreover, the through-holes 35, such as a circular hole and a slit, are formed in the magnetic-flux shield 31 if needed. Since the amount of magnetic flux which penetrates the magnetic-flux shield 31 and arrives towards the metal sleeve 11 by this is controllable, it can prevent that the temperature of the non-**** field of the metal sleeve 11 falls more than required. Therefore, when the temperature rise of a non-**** field is stopped too much, temperature becomes low extremely and a temperature gradient with the **** field in the metal sleeve 11 arises The internal stress of the metal sleeve by partial heat deformation will occur and carry out. reduce a life or Moreover, when the record material of large-sized size is made to **** the record material of small size after ****, the situation which causes obstacles, such as a skew of record material, and paper Siwa, fixing nonuniformity, for the aforementioned temperature gradient can be prevented.
[0037] Next, an operation of the fixing equipment of the form 1 of operation is explained.
[0038] If the high frequency current is energized to an induction coil 18, since the metal sleeve 11 consists of a magnetic metal, induction of the RF induced current will be carried out, and it will generate heat. And an IH method has high exoergic efficiency, and since the metal sleeve 11 is formed in thin meat and low-fever capacity-ization is also attained, the temperature up of the metal sleeve 11 is carried out at high speed.
[0039] This metal sleeve 11 is pinched between the pressurization roller 13 and a electrode holder 12, obtains driving force with the pressure welding of the pressurization roller 13, and carries out follower rotation with rotation of this pressurization roller 13. The record material 14 by which the non-established toner image is imprinted is sent in towards the nip section 23 between these metal sleeve 11 and the pressurization roller 13, and while the pressure which acts from the heat and the pressurization roller 13 of the heated metal sleeve 11 is applied, it is fixed to a toner on the record material 14 by conveying the nip section 23.
[0040] Here, when ****(ing) the record material of small size rather than the maximum main street paper width, the variation rate of the position of the magnetic-flux shield 31 is carried out by the drive of a motor 34 to a wrap position in the induction coil 18 of the shaft-orientations range equivalent to the non-**** field of the metal sleeve 11. The magnetic flux which reaches the non-**** field of the metal sleeve 11 from an induction coil 18 is covered by this, and the situation where the temperature of the metal sleeve 11 in a non-**** field rises rather than the ** tone temperature of the metal sleeve 11 in a **** field is prevented. On the other hand, in ****(ing) the record material of large-sized size, it evacuates the magnetic-flux shield 31 to the outside of ****** of the record material of large-sized size by the drive of a motor 34. Thereby, the metal sleeve 11 is uniformly heated in response to the magnetic flux from an induction coil 18.

[0041] Thus, it becomes possible to control the heat distribution of the metal sleeve 11 by which a temperature up is depended and carried out to the kind of size of the record material which ****, even if it is the metal sleeve 11 of thin meat according to the gestalt 1 of operation, and except a required portion, since the generation of heat itself is not carried out, heat loss is small and also serves as energy saving.
[0042] Therefore, it becomes possible to reduce the temperature rise in the non-**** field of the metal sleeve 11, and the temperature nonuniformity of the longitudinal direction of this metal sleeve 11 can be suppressed. Generating of the elevated-temperature offset by nonuniformity with the fixing nature partial by this at the time of **** of the large-sized size record material just behind **** of small size record material, Paper Siwa by the temperature-similarly nonuniformity at the time of **** of the large-sized size record material just behind **** of small size record material, Generating of a skew or a jam, generating of the internal thermal stress by the temperature-distribution difference in the metal sleeve 11, and degradation accompanying this, The fault by the temperature rise of the non-**** field of the metal sleeves 11, such as melting by exceeding the heat-resistant temperature of the component part of fixing equipment, deformation, or an injury, can be prevented efficiently.
[0043] Drawing 3 (A) and (B) are the perspective diagrams roughly showing the electrode holder of the fixing equipment of the IH method concerning the gestalt 2 of operation of this invention.
[0044] The gestalt 2 of this operation is the point that it is fixed or unified and the magnetic-flux cover means of thin meat is established on the surface of the electrode holder, and is different from the gestalt 1 of operation. In addition, the same sign is given to the member which is common in the gestalt 1 of operation, and it omits suitably about the explanation (setting in the gestalt of subsequent operations the same). Thus, a magnetic-flux cover means can be arranged certainly and compactly by making the magnetic-flux cover means which consists of copper foil of thin meat etc. unite with the front face of a electrode holder prepared between a metal sleeve and an induction coil for an electric short circuit protection. In this case, the variation rate of the position of a magnetic-flux cover means can be carried out to shaft orientations etc. with a electrode holder.
[0045] moreover, especially with the gestalt of operation shown in drawing 3 (A) or (B) While taking the composition which the surface area of the magnetic-flux cover means 32 of thin meat is changed to shaft orientations, and arranges it Since it constituted possible [rotation of a electrode holder 12], it becomes controllable [the heat distribution of the metal sleeve 11] by rotating a electrode holder 12 in the space which the range of a covered portion could be changed, therefore was restricted extremely.
[0046] Drawing 4 is the perspective diagram roughly showing the fixing equipment of the IH method concerning the form 3 of operation of this invention. The form 3 of this operation is IH fixing equipment using the metal sleeve like the form 1 of operation, eliminates the magnetic-flux shield 31 of the form 1 of operation, and is different from the form 1 of operation at the point which has arranged different magnetic-flux absorption meanses 37 and 38 from this.
[0047] As shown in drawing 4 , the magnetic-flux absorption meanses 37 and 38 are the things of the tabular which is arranged to the metal sleeve 11 at an induction coil 18 and an opposite side, i.e., the upper part, and presents an abbreviation semicircle arc surface. It fixes and the 1st magnetic-flux absorption means 37 is arranged so that the upper part of the position equivalent to ****** of small size record material, i.e., a **** field, may be covered, on the other hand, the 2nd magnetic-flux absorption means 38 is the outside of ****** of small size record material, and the upper part of the inside field of ****** of large-sized size record material, i.e., a non-**** field, is arranged possible [movement in a wrap position].
[0048] While the side edge section is guided by the guide rail 39, the 2nd magnetic-flux absorption means 38 is constituted so that forward/backward moving may be carried out to the shaft orientations shown by the displacement means 40 by the arrow in drawing according to the **** range in the metal sleeve 11.
[0049] As magnetic-flux absorption meanses 37 and 38, permeability is high, a ferrite with high specific resistance etc. is more desirable in property also in cost, and it is also possible to use what prepared the through-hole in magnetic material like iron, nickel, and those alloys.
[0050] With the form 3 of this operation, when ****(ing) the record material of small size rather than the maximum main street paper width, the variation rate of the position of the 2nd magnetic-flux absorption means 38 is carried out by the drive of a motor 34 in the right in drawing, i.e., the **** field of the metal sleeve 11. Thereby, from an induction coil 18, the magnetic flux which reaches the non-**** field of the metal sleeve 11 decreases compared with the magnetic flux which reaches a **** field, and the temperature rise of the metal sleeve 11 in a non-**** field is stopped and soaking-ized. On the other hand, when ****(ing) the record material of large-sized size, the variation rate of the position of the 2nd magnetic-flux absorption means 38 is carried out by the drive of a motor 34 in the left in drawing, i.e., the non-**** field of the metal sleeve 11. The density of the magnetic flux which reaches the metal sleeve 11 becomes the same in the length direction of this metal sleeve 11 from an induction coil 18 by this, and the metal sleeve 11 is heated uniformly.
[0051] Thus, according to the form 3 of operation, by establishing a magnetic-flux absorption means and making it move, the flux density to the metal sleeve 11 can be changed partially, and it can become possible to control energy-absorption efficiency according to ******, therefore the temperature rise in the non-**** field of the metal sleeve 11 can be reduced, and temperature nonuniformity can be suppressed.
[0052] Drawing 5 (A) and (B) are the schematic diagrams showing the magnetic-flux absorption means of the fixing equipment of the IH method concerning the form 4 of operation of this invention with a metal sleeve. The form 4 of this operation constitutes a magnetic-flux absorption means from a member which deforms with temperature, is the point arranged near the metal sleeve 11, and is different from the form 3 of operation.
[0053] As shown in drawing 5 (A), the magnetic-flux absorption means 41 is constituted from bimetal 41a and 41b containing the copper of a couple, and this magnetic-flux absorption means 41 is arranged near the non-**** field of the metal sleeve 11.

Moreover, near the **** field of the metal sleeve 11, a magnetic-flux absorption means which is not illustrated to produce flux density equivalent to the magnetic-flux absorption means 41 in the state of drawing 5 (A) is fixed, and is arranged.
[0054] Although the temperature of the metal sleeve 11 in a non-**** field tends to rise with the form 4 of this operation rather than the ** tone temperature of the metal sleeve 11 in a **** field when ****(ing) the record material of small size continuously rather than the maximum main street paper width, in connection with this temperature rise, the magnetic-flux absorption means 41 deforms itself like drawing 5 (B) gradually, and the position changes. In addition, it is also possible for it not to be restricted to bimetal and to use a shape memory alloy as a member which deforms at temperature.
[0055] Since such a magnetic combination that it is close to the metal sleeve 11 whose magnetic-flux absorption means is a heating medium here is good, greatly, it decreases compared with the magnetic flux in which the magnetic flux which reaches the non-**** field of the metal sleeve 11 from an induction coil 18 reaches a **** field by the bird clapper, and the temperature rise of the metal sleeve 11 in a non-**** field is stopped by the aforementioned deformation, and distance from the metal sleeve 11 is soaking-ized.
[0056] According to the form 4 of this operation, it becomes controllable [it is not necessary to carry out control to which the information on record material size or temperature is made to feed back, and the variation rate of the position of a magnetic-flux absorption means is carried out to the ability to be very simply] by establishing a magnetic-flux absorption means to deform into the metal sleeve 11 at temperature.
[0057] Drawing 6 is the perspective diagram roughly showing the magnetic-flux generating means of the fixing equipment of the IH method concerning the form 5 of operation of this invention with a metal sleeve and a coil assembly. The form 5 of this operation is IH fixing equipment using the metal sleeve like the form 1 of operation, eliminates the magnetic-flux shield 31 of the form 1 of operation, and is different from the form 1 of operation at the point which has arranged a different magnetic-flux generating means 42 from this.
[0058] The form 5 of this operation is the point which has arranged a magnetic-flux generating means 42 to generate the magnetic flux which an induction coil 18 generates, and the magnetic flux from which a phase differs, in the near position of the non-**** field of the metal sleeve 11 while countering the induction coil 18, and is different from the form 1 of operation.
[0059] The magnetic-flux generating means 42 consists of coils made to generate the magnetic field from which the alternating field generated with an induction coil 18 and the phase shifted. In this case, the phase of the magnetic field which the magnetic-flux generating means 42 generates is the point that the alternating field by the induction coil 18 can be negated, and it is effective to make it this and an opposite phase. Moreover, the magnetic-flux generating means 42 has so large that it will carry out arrangement soon at the metal sleeve 11 an effect.
[0060] Thus, by establishing a magnetic-flux generating means 42 to generate the magnetic flux which an induction coil 18 generates, and the magnetic flux from which a phase differs, and controlling the amount of current passed to this magnetic-flux generating means 42, the generating range of the magnetic flux from which the aforementioned phase differs according to the **** range is changed, and the exoergic range of the metal sleeve 11 is controlled. In addition, it is also possible by moving magnetic-flux generating means 42 the very thing to consider as the composition to which the generating range of the magnetic flux from which the aforementioned phase differs is changed.
[0061] With the form 5 of this operation, when ****(ing) the record material of small size rather than the maximum main street paper width, it is energized by the magnetic-flux generating means 42. The magnetic flux which the induction coil 18 in a non-**** field generates will be negated by this, and it becomes possible to prevent the temperature rise in the non-**** field concerned. In addition, although control of the heating range becomes difficult a little, it is also possible to include the magnetic-flux generating means 42 in induction coil 18 the very thing which is a source of IH.
[0062] Drawing 7 is the perspective diagram roughly showing the fixing equipment of the IH method concerning the form 6 of operation of this invention. The form 6 of this operation is IH fixing equipment using the metal sleeve like the form 1 of operation, eliminates the magnetic-flux shield 31 of the form 1 of operation, and is different from the form 1 of operation in that it was made to change the position of induction coil 18 the very thing which is a source of IH to shaft orientations by the displacement means 40 according to the **** range in the metal sleeve 11. When the edge of an induction coil 18 keeps away from the edge of the metal sleeve 11 which is a heating medium to the method of outside with the form 6 of this operation, at the edge of the metal sleeve 11 of the opposite side, magnetic combination becomes weak. Therefore, by making into a non-**** field the edge of the direction where magnetic combination becomes weak, the calorific value of the field concerned can be reduced and it becomes possible to prevent the temperature rise of a non-**** field.
[0063] Drawing 8 is the shaft right-angled cross section of the fixing equipment of the IH method concerning the form 7 of operation of this invention. The form 6 of this operation is IH fixing equipment using the metal sleeve like the form 1 of operation, eliminates the magnetic-flux shield 31 of the form 1 of operation, and is different from the form 1 of operation according to the **** range in the metal sleeve 11 in [of the core 16 divided like illustration of the coil assembly 10] that it was made to change the position of 16a to shaft orientations in part. With the form 7 of this operation, by moving a part of core material for strengthening the magnetic combination with a metal sleeve, magnetic combination can be changed partially, and it becomes possible to change the exoergic range or calorific value by this, as a result the temperature rise of a non-**** field can be prevented.
[0064] In addition, the operation form explained above was not indicated in order to limit this invention, and it can be changed variously. For example, although the form of operation mentioned above explained the IH fixing equipment which used the metal sleeve which has flexibility as a heating medium, this invention is not restricted to this and, of course, can be applied also to the

IH fixing equipment which used the metal roller in the air.

[0065]

[Effect of the Invention] It becomes possible to control the heat distribution of the heating medium by which a temperature up is depended and carried out to the kind of size of the record material which will **** even if a heating medium is thin meat like according to this invention described above, and except a required portion, since the generation of heat itself was suppressed, heat loss is small and also serves as energy saving.

[0066] Therefore, it becomes possible to reduce the temperature rise in the non-**** field of a heating medium, and the temperature nonuniformity of the longitudinal direction of this heating medium can be suppressed. Generating of the elevated-temperature offset by nonuniformity with the fixing nature partial by this at the time of **** of the large-sized size record material just behind **** of small size record material, Paper Siwa by the temperature-similarly nonuniformity at the time of **** of the large-sized size record material just behind **** of small size record material, Generating of a skew or a jam, generating of the internal thermal stress by the temperature-distribution difference in a heating medium, and degradation accompanying this, The fault by the temperature rise of the non-**** field of heating mediums, such as melting by exceeding the heat-resistant temperature of the component part of fixing equipment, deformation, or damage, can be prevented efficiently.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the perspective diagram roughly showing the fixing equipment of the IH method concerning the gestalt 1 of operation of this invention.
[Drawing 2] It is the shaft right-angled cross section of identification arrival equipment.
[Drawing 3] (A) and (B) are the perspective diagrams roughly showing the electrode holder of the fixing equipment of the IH method concerning the gestalt 2 of operation of this invention.
[Drawing 4] It is the perspective diagram roughly showing the fixing equipment of the IH method concerning the form 3 of operation of this invention.
[Drawing 5] (A) and (B) are the schematic diagrams showing the magnetic-flux absorption means of the fixing equipment of the IH method concerning the form 4 of operation of this invention with a metal sleeve.
[Drawing 6] It is the perspective diagram roughly showing the magnetic-flux generating means of the fixing equipment of the IH method concerning the form 5 of operation of this invention with a metal sleeve and a coil assembly.
[Drawing 7] It is the perspective diagram roughly showing the fixing equipment of the IH method concerning the form 6 of operation of this invention.
[Drawing 8] It is the shaft right-angled cross section of the fixing equipment of the IH method concerning the form 7 of operation of this invention.
[Description of Notations]
11 -- Metal sleeve (heating medium),
12 -- Electrode holder (insulating member),
13 -- Pressurization roller,
14 -- Record material,
16 -- Core (core material),
18 -- Induction coil (source of IH),
31 32 -- Magnetic-flux cover means,
35 -- Through-hole
37, 38, 41 -- Magnetic-flux absorption member,
40 -- Displacement means,
42 -- Magnetic-flux generating means.

[Translation done.]